



High Touch High Tech®

Science Experiences That Come To You

The Power of Breakfast

Ingredients & Supplies

- 2-4 types of cereal with different percentages (amounts) of Iron (some examples are Cheerios, Total, Chex, Rice Krispies, Corn Flakes)
- 1 gallon of distilled water
- Heavy duty / super strong magnet
- 4 quart-sized Ziploc bags
- Measuring cup
- Black permanent marker

Instructions:

Iron is an essential vitamin for our bodies. How much iron is in your cereal? How does it compare to other cereals? Let's do an experiment and find out!

For this experiment, you will need 2-4 types of cereal with different amounts of Iron, water, a heavy duty magnet, 4 quart-size Ziploc bag, a measuring cup, and a black permanent marker.

Gather all of your materials. Use the black permanent marker to label each bag with the name of each different cereal. This will help you remember which cereal is in each bag after finishing the experiment. (All of the cereals will end up like mush, so you will not be able to tell them apart!)

Measure 1 cup of the first cereal. Pour the cereal in the Ziploc bag. Seal the bag. Crush up the cereal. You can squeeze the bag with your hands, or put the bag on the table and apply pressure. You want to break up the cereal into smaller pieces.

Now measure 1 cup of water. Pour the water into the same bag. (*This step is much easier with a partner. Ask a friend or adult to hold the bag as you pour in the water.*) Shake the bag to mix the cereal and water solution. You want the flakes to dissolve. You are making a slurry solution.

Next you will find out if there is iron in your cereal! Place the magnet in the palm of your hand. Put the slurry bag on top of the magnet. Gently shake the bag so that the all of the solution contents get a chance to touch the magnet.

Finally, turn your hand over and remove the magnet. Lay the bag in one hand and gently move the magnet above the bag. What do you see? Are there black droplets at the top of the bag? This is the iron being extracted from the cereal. The iron is attracted to the magnet!



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Now try the other cereals in different bags. What do you notice? Which cereals have more iron? Do the amounts match up to the Nutrition Facts from the cereal boxes? Does the cereal box say “Iron-Fortified”? Many food manufacturers include more iron in their product. “Iron-Fortified” means that extra iron was added.

The Science Behind It:

What is full of protein, carbohydrates, minerals, fiber, and tastes even better with milk? Cereal! This nutritious food is a staple for breakfast in many households. Do you like cereal? What is your favorite? Do you like cereal in a big bowl with milk or maybe eaten straight out of the box? Eating breakfast, especially when it is cereal, is an essential start to the day. Studies have shown that eating breakfast improves students’ mental abilities in the classroom and physical strength. Students have better concentration, positive attitudes, and improved memory. Scientists continue to find more reasons why we all should eat breakfast.

But, why is cereal so good for our bodies and our brains? Nutritious cereals contain essential vitamins, protein, and complex carbohydrates. Additives are ingredients that are ‘added’ to foods to make them more nutritious, taste good and even look better. Yet, some additives can be unhealthy. Some cereals contain additives that are not very good for our bodies. Extra sugar, food coloring, and more fats can create a not-so-healthy food. But, how do you know what foods are healthy and what can be harmful? Do you have cereal in your kitchen right now? Grab a box, and you can learn how to discover what is in the food you eat.

The USFDA (US Food and Drug Administration) requires all food manufacturers to display a Nutrition Facts label on all of their products. Take a look at your cereal box. The Nutrition Facts are in a white box with a black outline. The label is usually on the side or back of the box. Did you find it? Notice that the Nutrition Facts list many different vitamins and minerals. What type of vitamins and minerals are in your cereal?



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Here is the Nutrition Facts from a box of Cheerios that you can use as an example. Notice that Fat, Cholesterol, Sodium, Carbohydrate, Fiber, Sugars and Protein are listed on top. These are the main ingredients of the cereal. Underneath these ingredients you will see a list of all the added vitamins and minerals.

You will also see numbers and percentages on the right side of the Nutrition Facts. These are very important numbers called the “Percent Daily Value.” These numbers are based upon a daily diet of 2,000 calories. This is the number of calories that the USFDA recommends for a healthy adult. The “Percent Daily Value” provides the daily-recommended percentage of each nutrient for an adult. For example, this cereal contains 12% of the daily-recommended amount of Fiber. Now look at the Iron. How much of the daily-recommended amount of Iron does this cereal contain? For example, Cheerios contains 30% of the daily recommendation of Iron! Remember that the higher the percentage, the more of the nutrient is contained in the cereal.

Nutrition Facts		
Per 1 cup (30 g)		
Amount	Cereal Plus 125 mL Only 2% P.S. Milk	
Calories	120	180
	% Daily Value	
Fat 2 g*	3 %	7 %
Saturated 0.4 g + Trans 0 g	2 %	10 %
Cholesterol 0 mg		
Sodium 270 mg	11 %	14 %
Carbohydrate 22 g	7 %	9 %
Fibre 3 g	12 %	12 %
Sugars 1 g		
Protein 4 g		
Vitamin A	0 %	8 %
Vitamin C	0 %	0 %
Calcium	4 %	20 %
Iron	30 %	30 %
Vitamin D	0 %	25 %
Thiamine	4 %	8 %
Riboflavin	2 %	15 %
Niacin	6 %	15 %
Vitamin B ₅	10 %	15 %
Folate	8 %	10 %
Vitamin B ₁₂	0 %	25 %
Pantothenate	6 %	10 %
Phosphorus	10 %	25 %
Magnesium	15 %	25 %
Zinc	8 %	15 %

* Amount in cereal

Iron for a Healthy Body

Iron is an essential mineral for the human body. Iron helps to transport oxygen throughout the body. Around 2/3 of the body's iron is contained in *hemoglobin*, the substance in red blood cells that carries oxygen from your lungs to other areas of the body. When the body does not have enough iron, it is called iron deficiency *anemia*. The body needs iron to make hemoglobin for the red blood cells to carry oxygen to the different parts of the body. Many foods and vitamins contain extra iron to make sure we maintain healthy bodies!

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